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ARS SCIENCE HALL OF FAME

September 15

2004

**Agricultural Research Service
U.S. Department of Agriculture**

Agricultural Research Service

SCIENCE HALL OF FAME

The ARS Science Hall of Fame was inaugurated in 1986. We determined that each succeeding year, one or more present or former scientists with the Agricultural Research Service could be selected, subject to the following criteria:

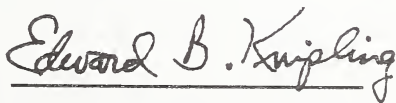
The selectee made widely recognized impact on agricultural research by the solution of a significant agricultural problem through research.

The selectee is a person whose scientific accomplishments and stature continue to affect the agricultural research community and/or influence the development of science-based agricultural policy.

The selectee's character and record of achievement have brought major recognition and credibility to ARS and/or USDA, and are worthy of emulation by younger agricultural scientists.

The selectee's achievements must be or have been nationally and/or internationally recognized by peers in the scientific community.

Today we honor three outstanding scientists by inducting them into the Science Hall of Fame. A plaque citing the achievements of each will be on permanent display in the ARS National Visitor Center at the Beltsville Agricultural Research Center.

A handwritten signature in dark ink, reading "Edward B. Knipling". The signature is written in a cursive style with a horizontal line underneath the name.

Edward B. Knipling
Acting Administrator



SCIENCE HALL OF FAME

Donald K. Barnes

Research Leader and Research Geneticist (Retired)
Plant Science Research Unit
St. Paul, Minnesota

For remarkable contributions to alfalfa breeding and genetics, mentoring of plant breeding students, and service to ARS and the scientific community.

Donald Barnes is a pioneer in alfalfa improvement. By developing the means to breed alfalfa for increased pest resistance and improved nitrogen nutrition, he paved the way for marked improvements in alfalfa yields and quality. Furthermore, he almost singlehandedly mentored a generation of alfalfa geneticists.

His greatest achievement was reducing by more than a third the seed required to establish and maintain over 20 million acres of alfalfa around the world.

In the early 1970s, Barnes recognized the importance of the legume plant itself in nitrogen nutrition. Before that, researchers sought only to improve the root bacteria that fix nitrogen for the plant's use. Barnes's breeding methods increased the alfalfa plant's capacity to produce, store, and use nitrogen and helped farmers become less dependent on chemical fertilizer. His methods have been applied to many other legume crops.

Barnes also had the ability to predict what kinds of problems alfalfa growers would face in the future. Foreseeing that wilt disease and nematode predation, for instance, would someday become serious threats, he developed resistant germplasm that could be rapidly incorporated into new cultivars as these problems surfaced.

Barnes has received awards from the Crop Science Society of America, the North American Alfalfa Improvement Conference, the National Council of Commercial Plant Breeders, and the Certified Alfalfa Seed Council. USDA has recognized his work with several Certificates of Merit and the ARS Distinguished Service Award.



SCIENCE HALL OF FAME

Ruth Rogan Benerito

Research Leader and Research Chemist (Retired)

Cotton Chemical Reactions Laboratory

New Orleans, Louisiana

For applying physical chemistry to solve problems that led to improved procedures and new uses for renewable resources such as cotton, wood, and paper.

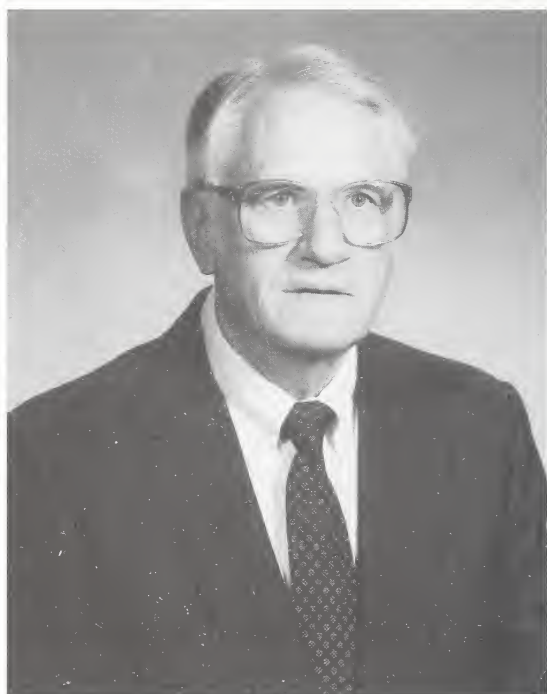
Ruth Rogan Benerito was a pivotal person in the development of wrinkle-free cotton fabrics, making the natural fiber competitive with synthetics. Her basic research in the physical chemistry of cellulose opened up vast potentials in the manufacture of cotton, wood, and paper products.

In the 1950s and 1960s, demand for cotton fabrics was losing ground to easy-care synthetics. Using monofunctional agents to modify cotton, Benerito demonstrated a new mechanism for imparting wrinkle resistance that made cotton fabrics as easy to care for as synthetics.

Benerito's work led to new products and new procedures in the fabric, wood, and resin industries. She showed that radio-frequency cold plasmas can replace the polluting sodium hydroxide in cleaning cotton. Her original methods for analysis of cellulose products have benefitted a variety of industries in the United States and around the world.

Dr. Benerito has received numerous honors—from the Fiber Society, the American Institute of Chemists, the American Chemical Society, including the Garvan Medal, the Louisiana Institute of Chemists, Louisiana State University, Tulane University, which presented her with an honorary doctorate, and the U.S. Department of Agriculture, including the Distinguished Service Award. She was named one of "America's 75 Most Important Women" by Ladies' Home Journal in 1971 and a "Woman of Achievement of the Century" at the Louisiana World Exposition in 1984. In 2002 she was presented with the Lemelson MIT Lifetime Achievement Award.

Ruth Rogan Benerito is widely recognized as one of the foremost inventors of the 20th century.



SCIENCE HALL OF FAME

Keith E. Gregory

Research Geneticist (Retired)

Roman L. Hruska U.S. Meat Animal Research Center
Clay Center, Nebraska*For outstanding research contributions in genetics and breeding of
beef cattle and for leadership of ARS research programs.*

K eith Gregory has greatly expanded the potential of beef cattle breeding through understanding of heterosis, or "hybrid vigor." With the methods and knowledge developed by Gregory, breeders can create cattle herds that fit their specific requirements.

Crossbreeding can increase lifetime production because of better survival and growth of calves, higher reproductive rate, and longer breeding life. These factors reduce production costs, which reduces cost to the consumer. However, the traditional rotational crossbreeding system is often difficult to manage.

Gregory developed a breeding system based on "composite" cattle—lines that mix characteristics from a number of breeds to meet specific criteria such as feed availability, climate, or market characteristics. He showed that herds based on composites can, with proper management, retain significant heterosis and desired characteristics more consistently than those based on rotational crossbreeding. This work has affected beef cattle breeding around the world.

He also established a program characterizing diverse breeds of cattle and categorizing germplasm by traits important in beef production. Another project has shown how to select for increased—or decreased—frequency of twins in cattle. Gregory has consulted on development programs in Africa, Asia, and South America.

Dr. Gregory has been honored with awards from the American Academy for the Advancement of Science, the American Society of Animal Science, the American Polled Hereford Association, the Beef Cattle Improvement Federation, and the National Cattlemen's Association. He was inducted into the Nebraska Hall of Agricultural Achievement in 1993. In addition, he has received Certificates of Merit from the U.S. Department of Agriculture.

ARS SCIENCE HALL OF FAME

1986

Edward F. Knippling

For pioneering research and leadership in development of the sterile insect technique, which led to the eradication of the screwworm, and of other technologies to suppress and manage insect pests.

1987

Howard L. Bachrach

For pioneering research on the molecular biology of foot-and-mouth disease that led to development of the world's first effective subunit vaccine for any disease of animals or humans through the use of gene splicing.

Myron K. Brakke

For consistent, career-long valuable contributions to the science of virology, particularly plant virology.

Glenn W. Burton

For outstanding achievements in forage and turf science, which have had extraordinary effects on the forage-based cattle industry, the turf industry, and agriculture worldwide.

Wilson A. Reeves

For outstanding research and leadership in the field of textile chemical finishing that have significantly benefited agriculture and consumers.

Earnest R. Sears

For pioneering work in wheat genetics and for discoveries on chromosomal mechanisms that established standards in animal, plant, and human genetics.

Orville A. Vogel

For development of the first useful semidwarf wheats and of innovative production systems that made the Pacific Northwest a major source of soft white wheat, inspired similar research efforts throughout the world, and sparked the Green Revolution.

Cecil H. Wadleigh

For elucidating the mechanisms through which crops respond to salinity and water stress and for inspired planning and leadership that enabled and motivated those who worked with him to expand and make use of knowledge of soils, water, and air and their interactions with plants.

1988

Francis E. Clark

For outstanding research leading to greater understanding of soil, plant, and microbial interactions and of nutrient cycling in terrestrial ecosystems.

Edgar E. Hartwig

For research in soybean breeding and genetics that has been a major factor in soybeans becoming the second most valuable U.S. crop and particularly for developing cultivars that thrive in the South.

Ralph E. Hodgson

For significant contributions to the knowledge of ruminant nutrition and for visionary leadership, both domestic and international, in the animal industries.

Hamish N. Munro

For career-long contributions to the science of nutrition, particularly on the relationship of dietary protein and iron to the health of the elderly, and for promotion of studies on aging.

Jose Vicent-Chandler

For research leading to new and greatly improved production systems for beef, milk, coffee, plantains, and rice for Puerto Rico and Caribbean countries.

1989

Douglas R. Dewey

For world leadership in genetics and taxonomy of the Triticeae tribe of grasses and for development of the cytogenetic basis for creating new grass hybrids.

Theodor O. Diener

For conceptualizing and discovering viroids, for leading research on viroid detection and control, and for inspiring new approaches in the search for causes of several serious diseases affecting plants, livestock, and humans.

Karl H. Norris

For developing principles and instruments using the electromagnetic wave spectrum to make rapid nondestructive measurements for evaluating quality of agricultural products.

John F. Sullivan

For engineering contributions to the food-processing and preservation industries, including development of instant potato flakes and of batch and continuous-explosion puffing.

1990

Theodore C. Byerly

For extraordinary contributions as a scientist, research leader, and administrator to the success of agricultural research programs and advances in U.S. and world agriculture.

Gordon Dickerson

For research contributions widely used by breeders to increase production efficiency of cattle, sheep, swine, and poultry.

Robert W. Holley

For isolation and characterization, including the first nucleotide sequence, of transfer ribonucleic acid (tRNA).

Virgil A. Johnson

For outstanding contributions to development of superior bread wheat cultivars and of improved wheat germplasm and for vigorous promotion of national and international cooperation among wheat breeders.

George F. Sprague

For outstanding contributions to effective methods of hybrid corn breeding and germplasm improvement.

1991

John H. Weinberger

For outstanding lifelong contributions in development of fruit varieties and fruit-breeding technology.

Walter H. Wischmeier

For developing the Universal Soil Loss Equation, which has been widely used for three decades worldwide in conservation and management of our natural resources.

1992

Raymond C. Bushland

For pioneering research leading to screwworm eradication by the sterile insect technique and for research leading to control of typhus vectors.

Lyman B. Crittenden

For significant contributions to retroviral genetics, transgenic animal development, and genome mapping in poultry.

Arnel R. Hallauer

For increasing understanding and use of quantitative genetics in plant breeding, which has led to development of many superior corn hybrids worldwide.

1993

John R. Gorham

For scientific leadership and studies that have resulted in solutions of disease control problems and have advanced the basic knowledge of viral and genetic diseases in humans and animals.

Sterling B. Hendricks

For significant contributions as a chemist, physicist, mathematician, plant physiologist, geologist, and mineralogist.

Clair E. Terrill

For scientific contributions and worldwide leadership in sheep production research

1994

Charles N. Bollich

In recognition of superlative accomplishments in rice breeding and genetics and their consequent benefits to American agriculture.

Chester G. McWhorter

For outstanding contributions to American agriculture through basic and applied research that has resulted in improved weed-management technology, increased yields, and reduced cost of production.

Malcolm J. Thompson

For career research contributions in the field of insect and plant steroid biochemistry.

1995

Harry Alfred Borthwick

In recognition of contributions in elucidating the importance of photoperiodic mechanisms controlling flowering in plants.

William M. Doane

For initiating, leading, and conducting research that created new and useful products and led to the establishment of new industries based on agricultural raw materials.

Walter Mertz, M.D.

For contributions and leadership in elucidating the importance to health of several trace elements and promoting research on dietary risk factors for chronic disorders.

1996

Fred W. Blaisdell

For pioneering research and development of improved structures for soil and water conservation.

Herbert J. Dutton

For pioneering research leading to the establishment of soybean oil as the predominant edible vegetable oil in the world.

Charles Jackson Hearn

For developing improved orange, grapefruit, and tangerine varieties used extensively by U.S. citrus producers to replace trees killed by the 1980 freezes and to expand the citrus acreage.

1997

Morton Beroza

For major contributions to the development of environmentally compatible insect control strategies through discovery of lures, attractants, repellents, and pheromones.

R. James Cook

For extraordinary research on sustainable approaches to improve wheat health and for leadership in the transfer of information and technology resulting in solutions to agricultural problems.

William L. Ogren

For outstanding leadership and fundamental contributions to photosynthetic carbon metabolism leading to the discovery of new opportunities to improve the efficiency and productivity of crop plants.

1998

Thomas J. Henneberry

For conducting basic and applied individual and team research that has had sustained global impact on development and implementation of integrated pest management systems.

James H. Tumlinson III

For research that led to eradication of the boll weevil from the southeastern United States and the discovery of the chemical basis of plant-insect-parasite interaction.

1999

Allene R. Jeanes

For microbiological, chemical, and engineering research that created urgently needed, life-saving industrial polymers made from agricultural commodities.

Charles W. Stuber

For pioneering the use of molecular markers in identifying, mapping, and manipulating quantitative trait genes.

Richard L. Witter

For outstanding research contributions and leadership in the field of avian tumor viruses.

2000

Virginia H. Holsinger

For research leading to increased use of milk products and for humanitarian efforts in developing nutritious formulations for international food donation programs.

Marvin E. Jensen

For advancements in irrigation scheduling using computer models to estimate soil-water balance and for advancements in evapotranspiration theory.

Harley W. Moon

For contributions to a fundamental understanding of intestinal diseases in livestock and for development of effective control programs for these diseases.

2001

Lawrence A. Johnson

For pioneering research in developing the first useful technology for gender preselection of animal and human offspring and for outstanding contributions to semen preservation and artificial insemination in swine.

William E. Larson

In recognition of a pioneer who respected soil as a natural resource and devoted a research career toward improving its quality.

William L. Mengeling

For outstanding research contributions and leadership in the field of viral diseases of swine.

2002

George Inglett

In recognition of the development of novel, patented food ingredients including Oatrim and Nutrim, which have had a sustained beneficial effect on the American diet.

K. Darwin Murrell

For landmark research on parasites of veterinary and medical importance, especially trichinellosis of swine, and innovative development and leadership of laboratory and agency-level programs that established and advanced objectives of the Agricultural Research Service.

Stuart O. Nelson

For pioneering research on the dielectric properties of agricultural materials, applications of radio-frequency and microwave energy, and electrical measurements for moisture sensing in cereal grains.

2003

Edward B. Bagley

For outstanding research in rheology and food science that generated fundamental understanding of flow mechanics; and for pioneering concepts in super-absorbent materials that resulted in one of the most successful technology transfers in USDA history.

Janice M. Miller

For pioneering research in understanding, diagnosing, and controlling bovine leukemia, transmissible spongiform encephalopathies, and other chronic infectious or zoonotic diseases of ruminants.

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